Writing Assembly programs in Keil 5

(Version 1.5)

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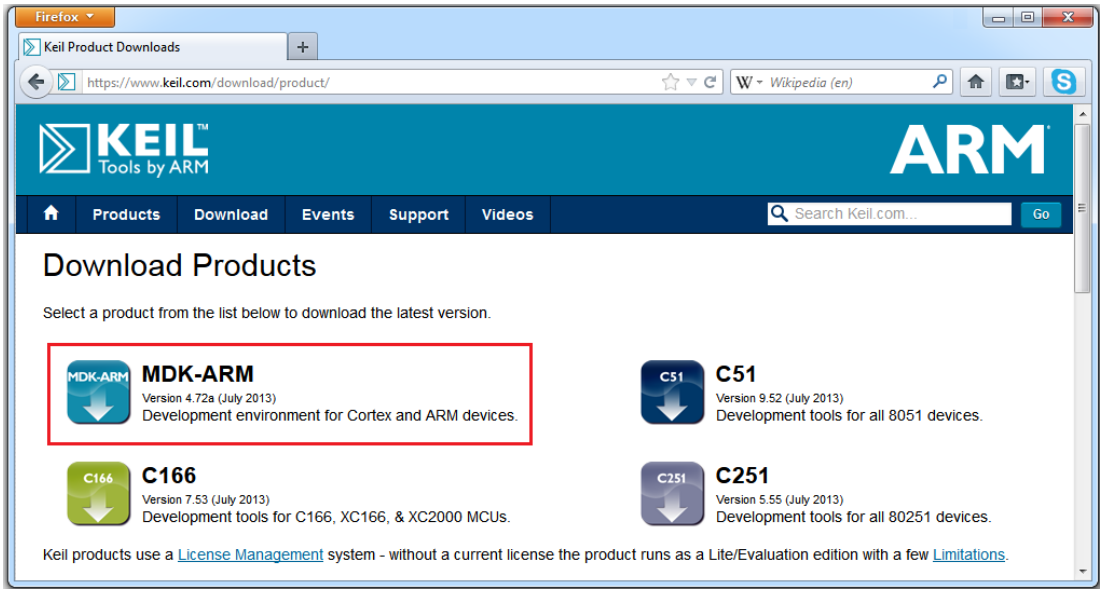
Contents

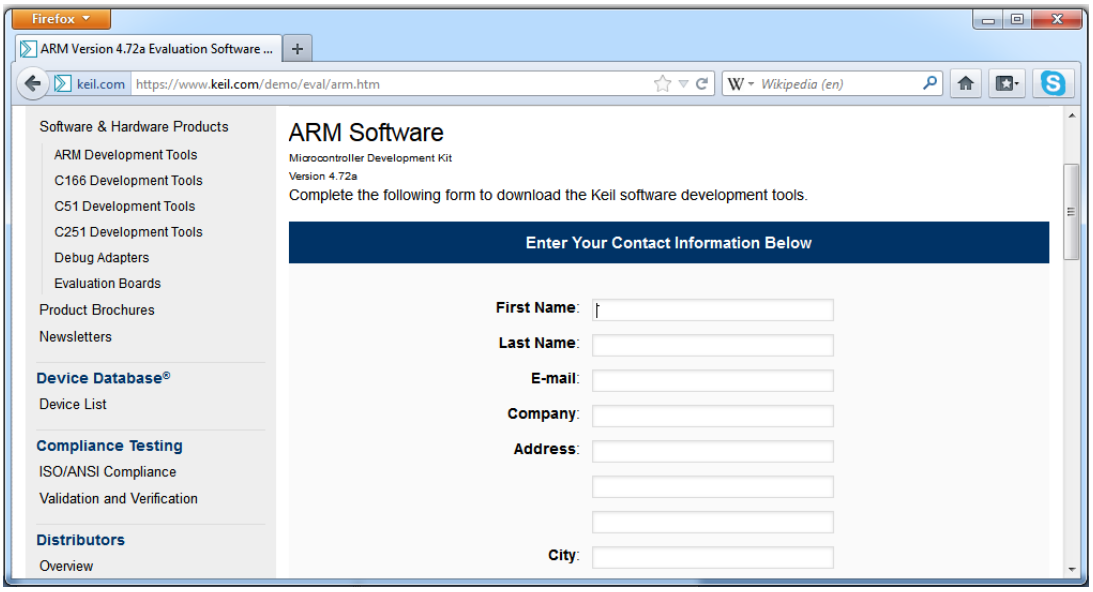
Downloading and installing the Keil IDE

1. Click on the following link:
   https://www.keil.com/download/product/

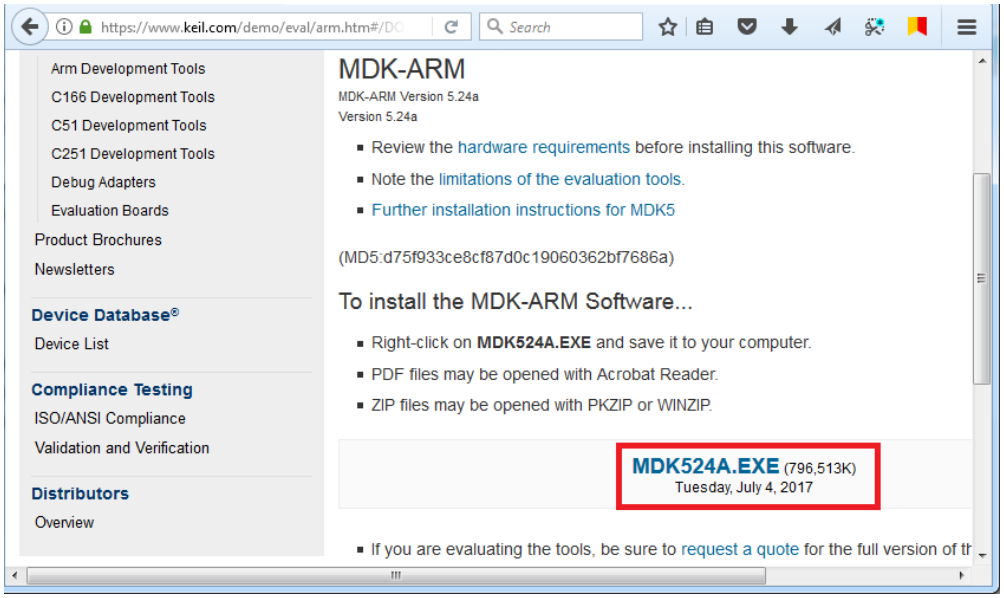
2. Choose MDK-ARM.



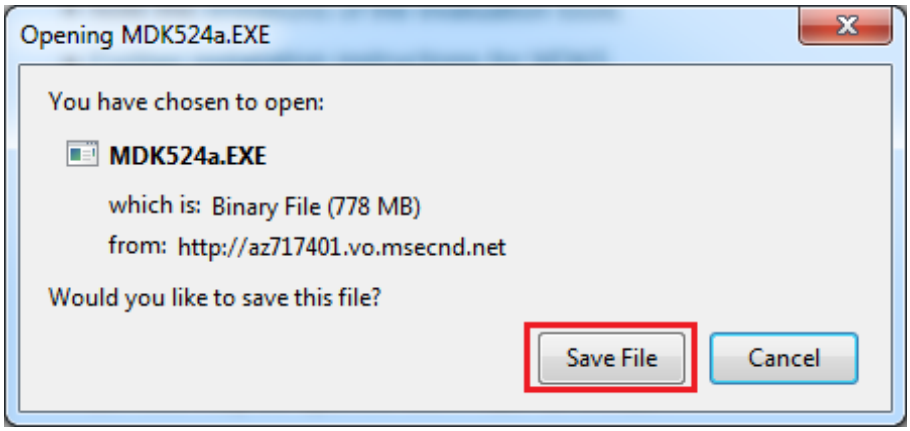
3. Fill out the form and then click on the ***submit*** button, at the bottom of the page.



4. Click on the ***MDKxxx.EXE*** link.



5. Choose ***Save***.

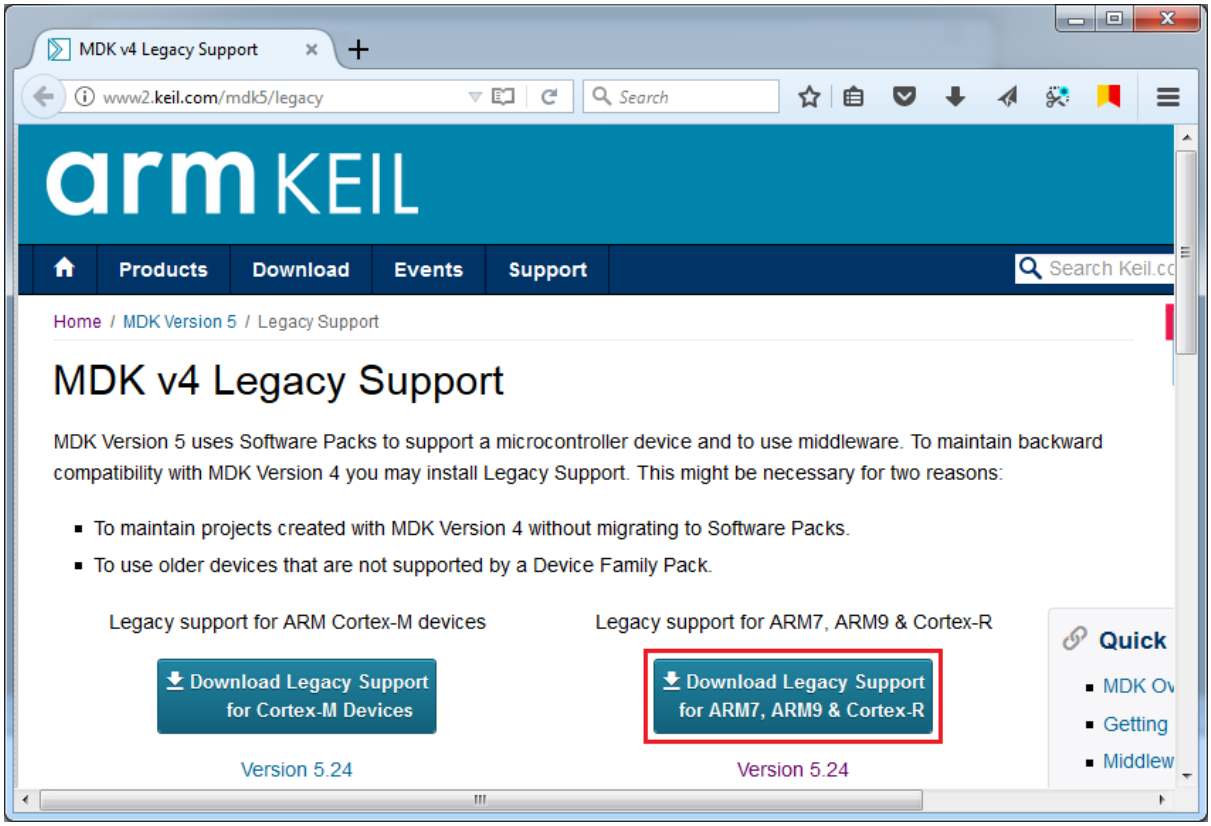


6. Execute the downloaded file. Installing the software is straight forward; choose the ***Next*** button in each step, until the setup finishes.

Installing Legacy support package for ARM7

7. Open the following link and click on Legacy Support for ARM7, ARM9 & Cortex-R.

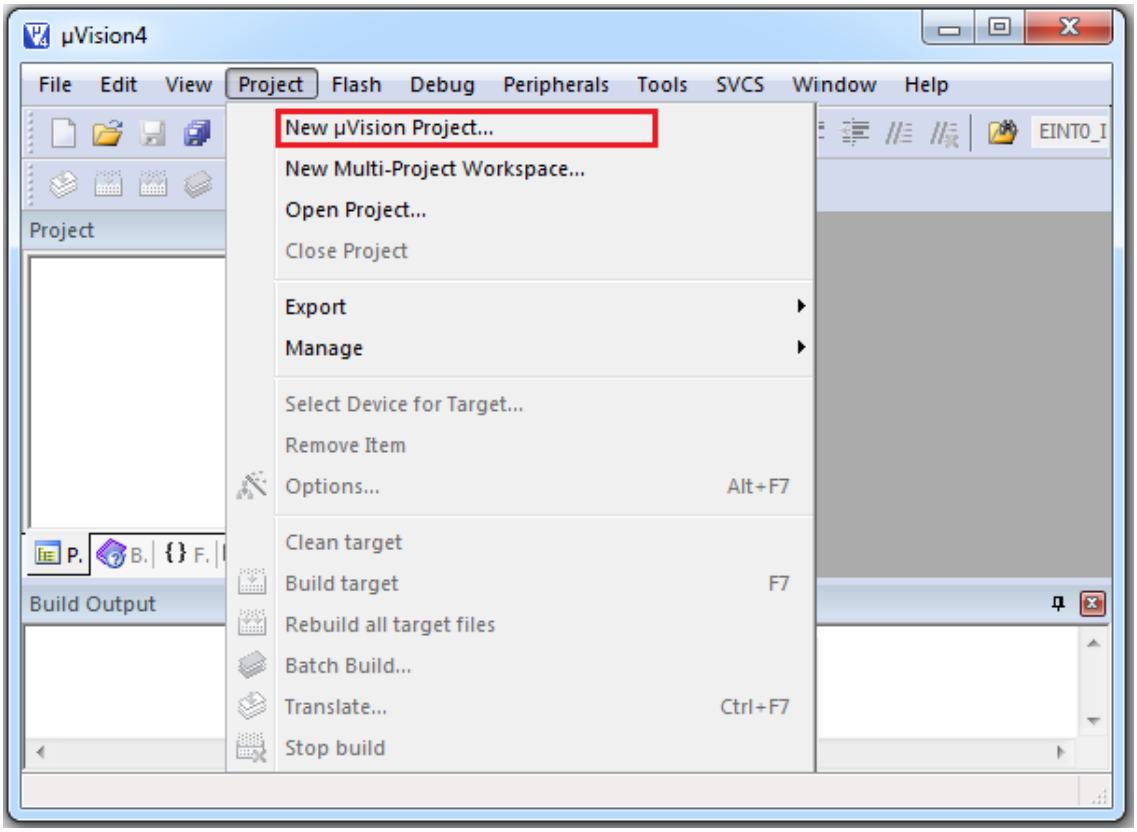
http://www2.keil.com/mdk5/legacy



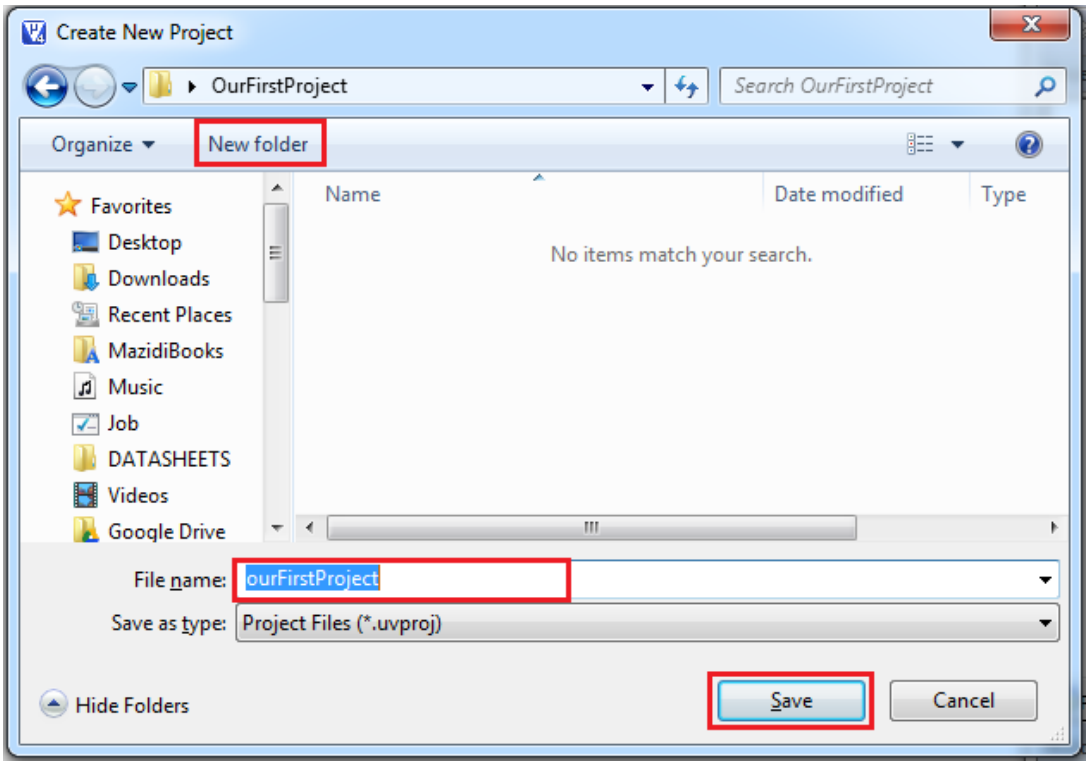
8. Install the downloaded file.

Creating an Assembly project in Keil

9. Open the Keil IDE by clicking on its icon on the desktop.
10. Choose ***New uVision Project*** from the ***Project*** menu.

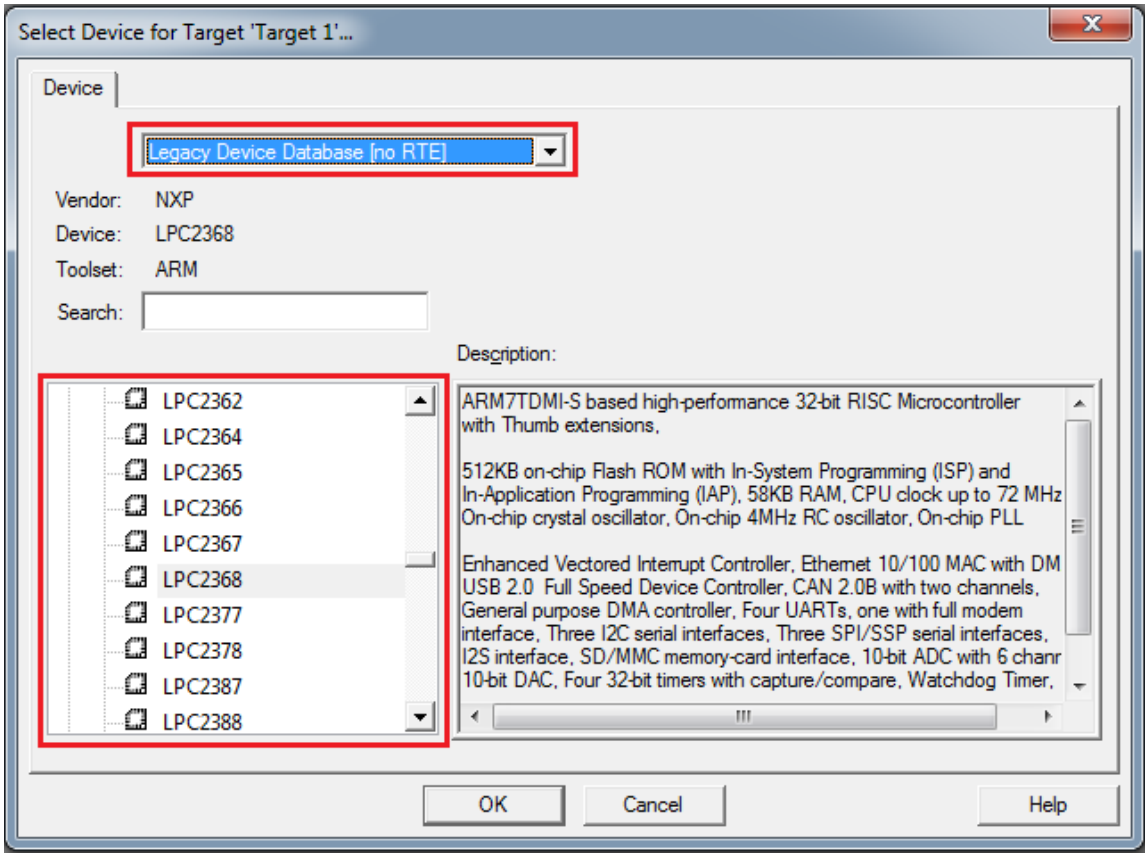


11. Create a new folder and Name it ***OurFirstProject.*** Type the name ***ourFirstProject*** for the project and click ***Save***.

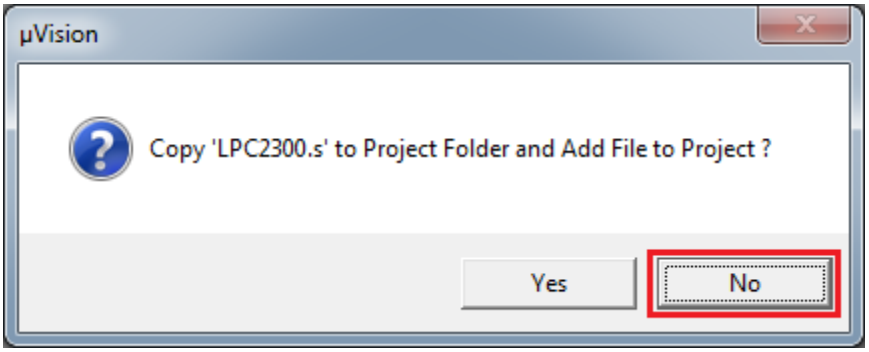


12. Select ***Legacy Device Database*** from the combo box. Then, in the ***Database*** tree, click on the ***NXP*** and choose ***LPC2368***. Then press ***OK***.

Caution
When you choose the chip some general information of the chip is shown in the ***Description*** box.

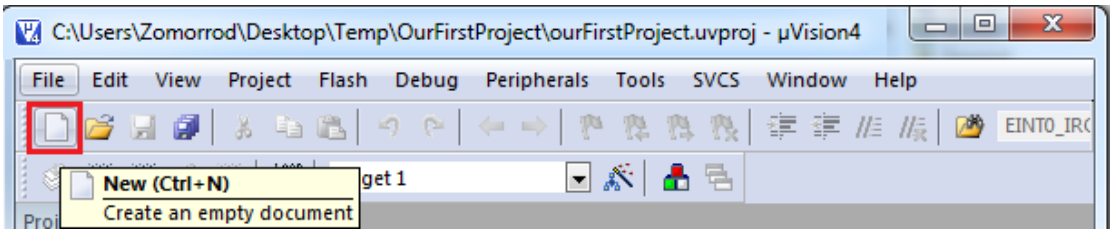


13. Click the ***No*** button to add the startup file to the project.

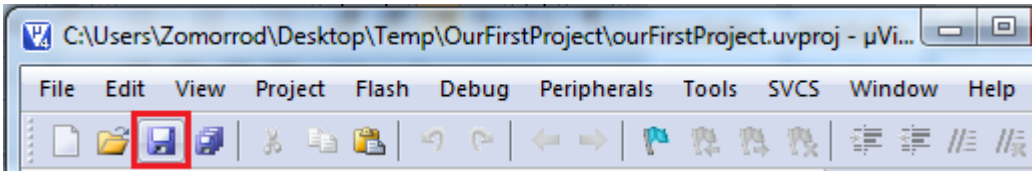


Caution
In your practical projects you should choose to add the startup file, as will be discussed in a separate tutorial.

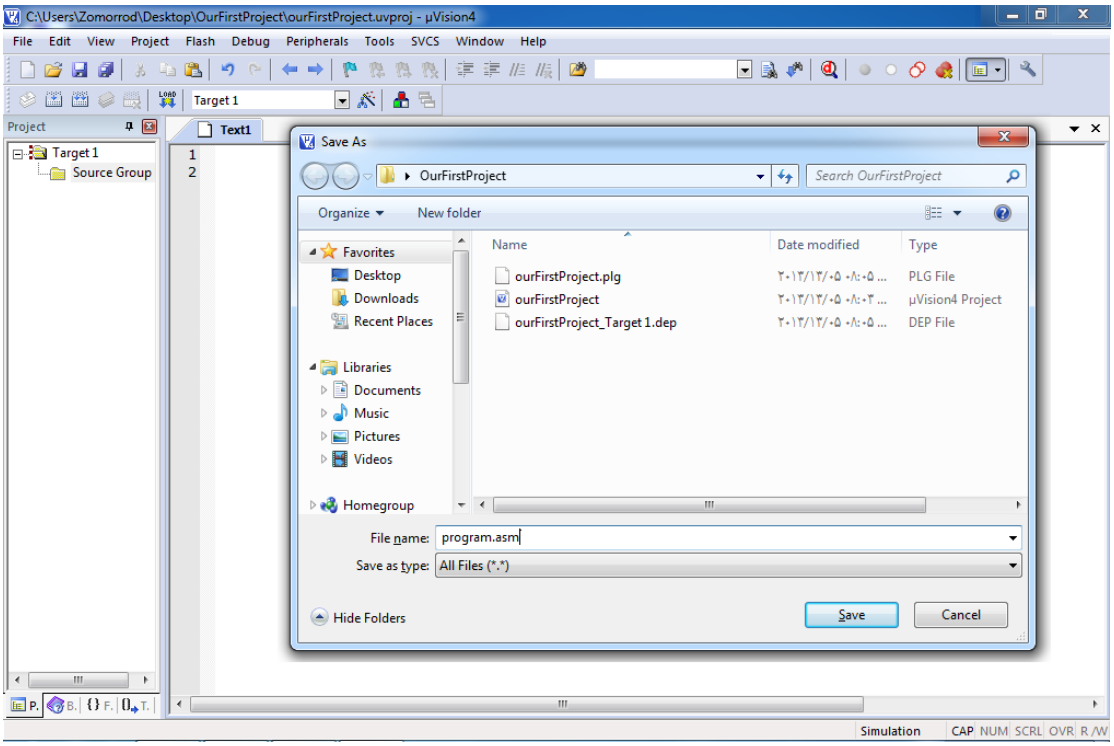
14. Make a new file by clicking on the New Icon (you can make a new file by pressing ***Ctrl+N*** or choosing ***New*** from the ***File*** menu, as well.)



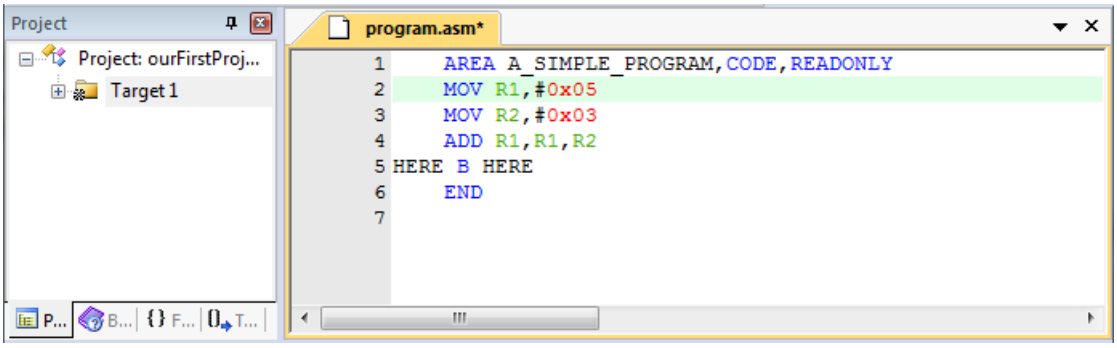
15. Press ***Ctrl+S*** to save the new file. (You can also save the file by choosing ***Save*** from the ***File*** menu.)



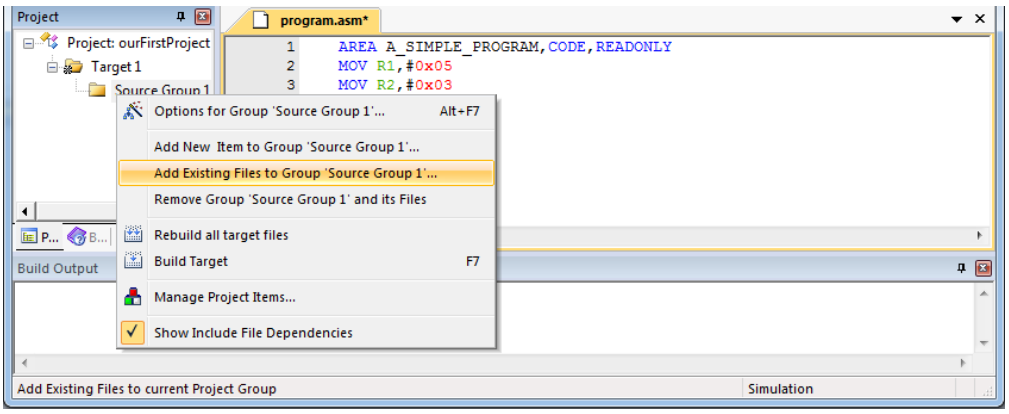
16. Name the file as ***program.asm*** and save it in the ***OurFirstProject*** directory.



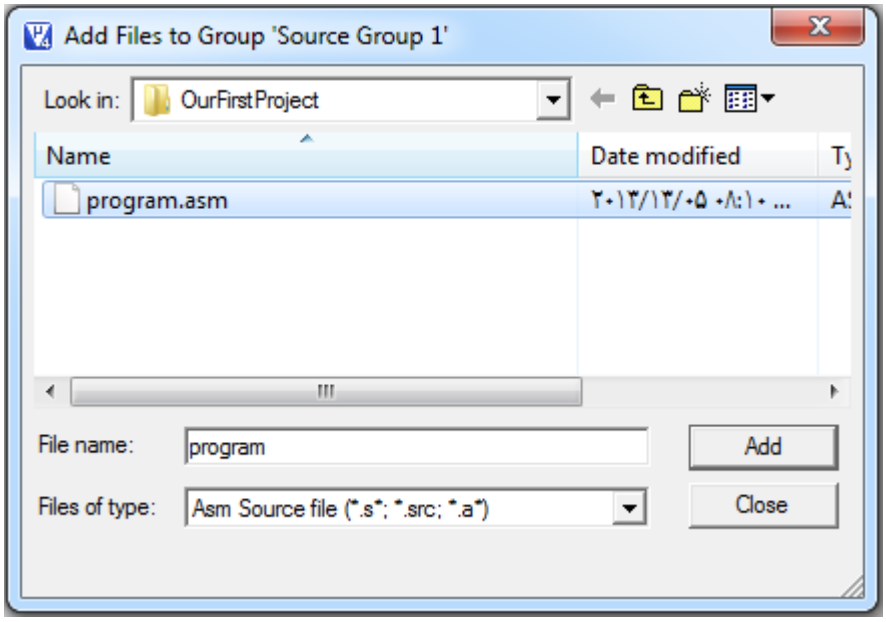
17. Type the following sample program in the file



18. Add the ***program.asm*** file to the project. To do so:
    a. Click on the + next to the ***Target 1*** to expand the tree. Right click on ***Source Group 1*** and choose ***Add Existing Files to Group***.

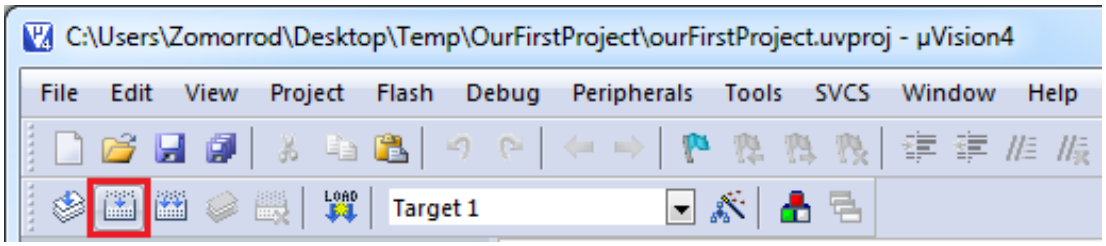


    b. Then go to the ***OurFirstProject*** directory and choose ***Program.asm***, press ***Add*** and then ***Close***.

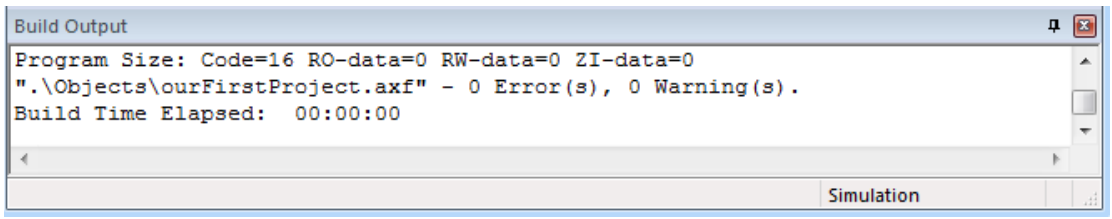


Building

19. To compile click on the ***Build*** icon or choose ***build target*** from the ***Project*** menu.



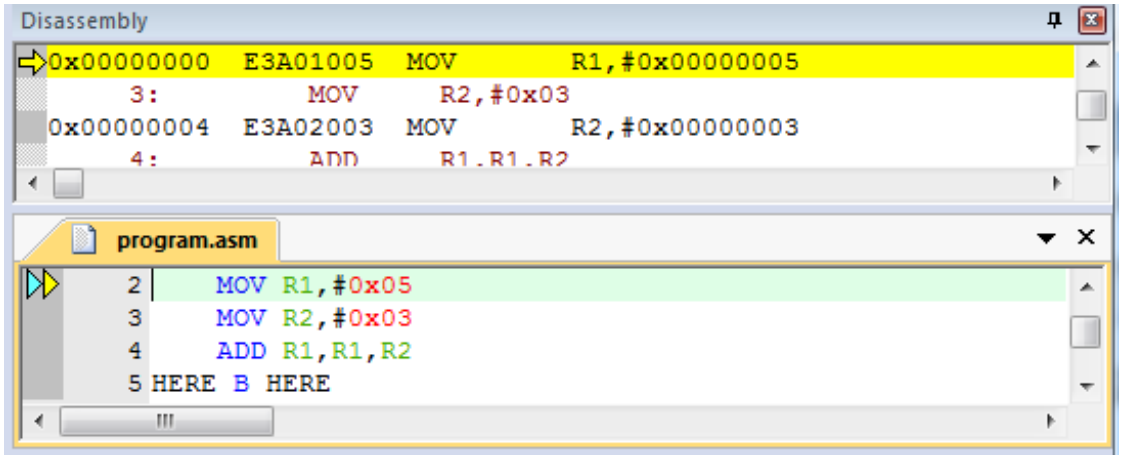
20. If the program is built successfully the following message appears:



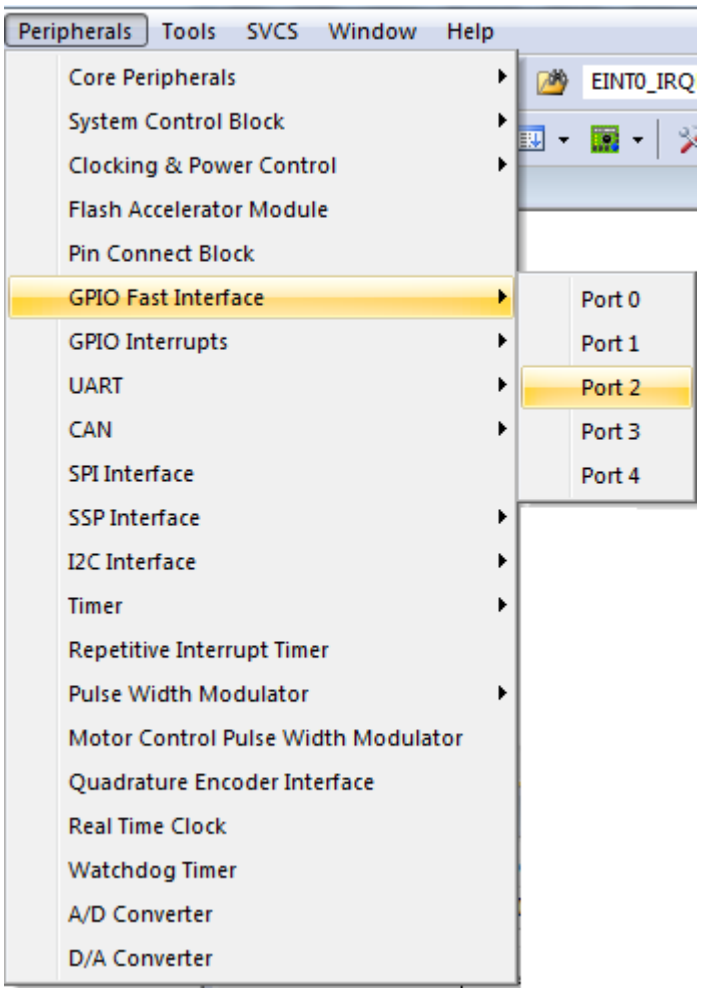
Debugging and Tracing

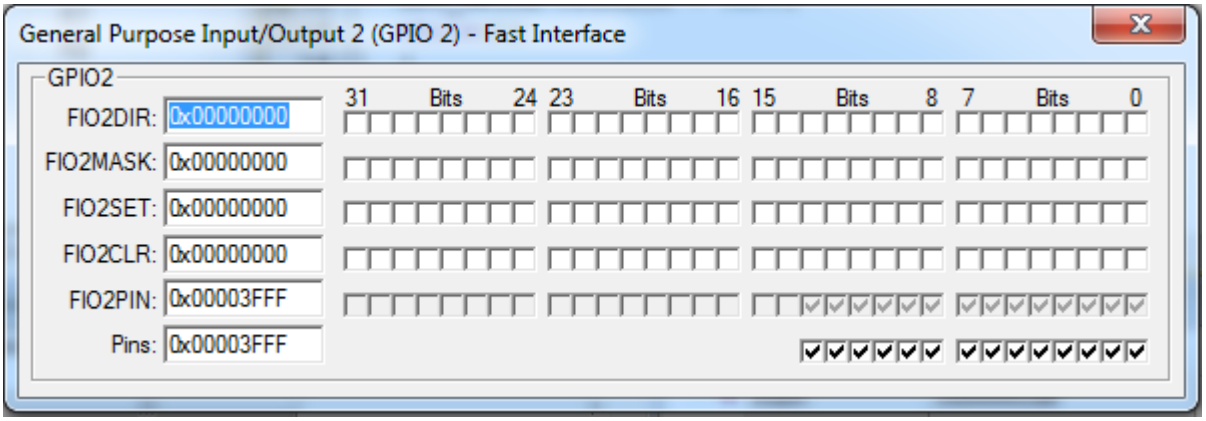
21. To start debugging click on ***Start/Stop Debug Session*** icon or choose ***Start/Stop Debug Session*** from the ***Debug*** menu. (or simply press ***Ctrl+F5***)

22. If it starts tracing successfully, a cursor appears in front of the next instruction to be executed.

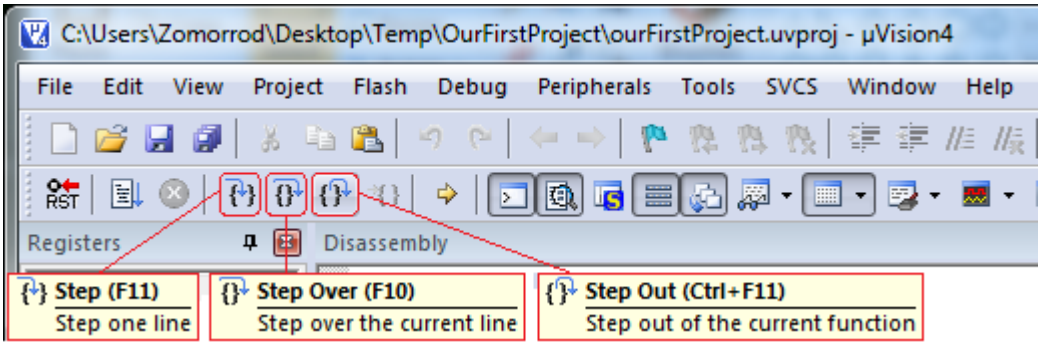


23. Go to the ***Peripherals*** menu. It has tools for monitoring different peripherals. For now, choose ***Port 2*** from ***GPIO Fast Interface***. It shows the registers of **Port 2;** you can see values of registers while tracing the program or change their values by clicking on each bit.





24. To trace the program, use the ***Step Over*** button or click on ***Step Over*** from the ***Debug*** menu. It executes the instructions of the program one after another. To trace the program, you can use the ***Step*** button, as well. The difference between the ***Step Over*** and ***Step*** is in executing functions. While ***Step*** goes into the function and executes its instructions one by one, ***Step Over*** executes the function completely and goes to the instruction next to the function. To see the difference between them, trace the program once with ***Step Over*** and then with ***Step***. When you are in the function and you want the function to be executed completely you can use ***Step Out***. In the case, the instructions of the function will be executed, it returns from the function, and goes to the instruction which is next to the function call.



25. To exit from the debugging mode press ***Start/Stop Debug Session***.